

# Clean Fuel Technology and Standards for sub-Saharan Africa



## Specifications, Emissions, Quality Monitoring, and the Future of Low-Carbon Fuels

Focus on: **The Manager** ☐ **The Specialist** ☐ **Spotlight Programme** ☒ **Hands-on Skills** ☒

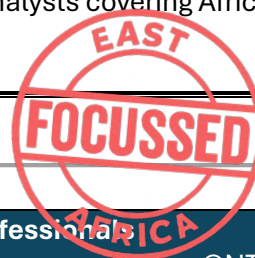


### Course Overview

As global and regional energy markets transition toward cleaner fuels, refiners, regulators, and downstream operators face rising pressure to meet stricter specifications while maintaining economic competitiveness. In Africa, this includes the shift to ultra-low sulfur fuels, ECOWAS fuel harmonization (50 ppm sulfur cap), and the operational impact of new refining capacity (Dangote Refinery, South Africa upgrades, Middle East imports).

This updated training program provides a modern and practical review of clean fuel production, quality control, and emissions standards, covering not only Euro 5/6 but also emerging low-carbon fuels such as biofuels, synthetic fuels, LNG, and hydrogen blends.

Course Objectives		This Course is Ideal For:	
1	Understand Clean Fuel Chemistry & Standards – from conventional fuels to emerging low-carbon alternatives.	✓	Refinery & downstream operations engineers
2	Analyze Gasoline, Jet, and Diesel Fuel Parameters – octane, cetane, sulfur, aromatics, volatility, and stability.	✓	Fuel quality & laboratory specialists
3	Apply Regional Standards – ECOWAS clean fuel specs, African Union low-sulfur roadmap, IMO 2020 (bunker fuels).	✓	HSE & emissions compliance officers
4	Evaluate Ultra-Low Sulfur Fuels – production technologies, blending economics, and impact on refinery margins.	✓	Corporate planning & economics managers
5	Troubleshoot Fuel Quality Problems – contamination, adulteration, and logistics issues in African supply chains.	✓	Government regulators (energy, environment, standards bodies)
6	Explore New Fuels for the Energy Transition – biofuels, GTL, synthetic fuels, hydrogen blends, and their implications.	✓	Supply chain & logistics professionals in fuel distribution
7	Leverage Digital Tools – fuel quality monitoring systems, IoT, and AI for compliance and traceability.	✓	Journalists & analysts covering Africa's fuel markets



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### Course Content

Day	Theme	Coverage
1	Fundamentals of Clean Fuels & Refining	<ul style="list-style-type: none"> <li>Crude oil chemistry, product fractions, and assays</li> <li>Refinery configurations for clean fuels (hydrocrackers, desulfurization, reformers)</li> <li>Petroleum product specs: gasoline, diesel, jet fuel, marine fuels</li> <li>African context: imports vs refining, Dangote refinery, ECOWAS sulfur roadmap</li> <li>Case Study: Transition to 50 ppm fuels in West Africa</li> </ul>
2	Gasoline & Alternative Blending Components	<ul style="list-style-type: none"> <li>Gasoline chemistry &amp; key refining processes (NHT, CCR, isomerization, alkylation)</li> <li>Testing parameters: octane, volatility, oxygenates, RVP, sulfur, benzene</li> <li>Bioethanol blending &amp; clean octane strategies</li> <li>Fuel adulteration issues in Africa (mixing, solvents, smuggling)</li> <li>Exercise: Designing a compliant RON 95 gasoline blend</li> </ul>
3	Jet Fuel & Aviation Standards	<ul style="list-style-type: none"> <li>Jet A-1 properties and refining technologies</li> <li>Testing: freezing point, flash point, thermal stability, aromatics, water content</li> <li>Biojet (SAF – Sustainable Aviation Fuel): pathways (HEFA, FT, ATJ)</li> <li>IATA/ICAO targets for sustainable aviation</li> <li>Case Study: Blending SAF with Jet A-1 – implications for African aviation markets</li> </ul>
4	Diesel & Marine Fuels	<ul style="list-style-type: none"> <li>Diesel chemistry &amp; ULSD production (hydrodesulfurization, additives)</li> <li>Cetane number, lubricity, cloud/pour point, sulfur content</li> <li>Fuel adulteration detection: kerosene/diesel mixing</li> <li>IMO 2020 sulfur cap for bunker fuels – VLSFO &amp; LNG bunkering trends</li> <li>Case Study: Nigerian diesel market – from high sulfur imports to Dangote clean diesel</li> </ul>

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5	Future of Fuels, Emissions & Monitoring Systems	<ul style="list-style-type: none"> <li>Euro 5/6 and ECOWAS standards: limits for sulfur, aromatics, particulates</li> <li>Emissions standards and their link to urban air quality</li> <li>Monitoring technologies: lab testing, portable analyzers, blockchain for supply chain traceability</li> <li>Low-carbon fuels: biofuels, GTL, hydrogen, synthetic e-fuels</li> <li>Strategic pathways: Africa's role in clean fuels &amp; energy transition</li> <li>Group Workshop: Designing a fuel quality monitoring program for an African market</li> </ul>
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Course Assessment	Certification
<b>Participants will be assessed on:</b> Participation in sessions Completion of exercises & case studies Performance in assessments	Upon successful completion of the course, participants will receive a <b>Certificate of Successful Completion</b> , along with a <b>Transcript of Marks</b> showing the performance by grade in each element of assessment and overall.

Course Instructor
<p>With BSc and PhD degrees from the UK, and with over 30 years of refinery technology, operations, and management expertise for several famous-name oil companies, this speaker is now an internationally-famous chemical engineering consultant.</p> <p>As a Chartered Chemist, a Member of the Royal Society of Chemistry and a Member of the American Institute of Chemical Engineers, he holds honorary appointments at a number of European universities and conducts cutting-edge research into vacuum distillation, gas recovery, absorption and pyrolysis.</p>

